Nonlinear State Space Model of a Hydraulic Wind Power Transfer

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Gearless hydraulic wind power systems are considered as nonlinear models because of some discrete elements such as check valves, proportional and directional valves, and leakage factor of hydraulic pumps and motors. These Nonlinearities will result in behavioral change in the system. This poster introduces nonlinear governing equations for the elements in the proposed hydraulic wind power configuration. Nonlinear state space representation of a hydraulic wind energy transfer for a single wind turbine system is presented. Simulation results are in good agreement with the experimental verifications obtained from prototype. The simulation response demonstrates accurate modeling of the system operation and close tracking of the reference for all states, pressure and pelocity profiles.

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